

1 Claims

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3 1. Circuit configuration (10; 110; 210) for generating a
4 control signal (Us) for an engine control unit (ECU)
5 designed to control at least one fuel injector of an
6 internal combustion engine, whereby operating parameters
7 of the internal combustion engine (p, T, ...) and/or of
8 the fuel injector are used for generating a modification
9 signal (S) input to the circuit configuration (10; 110;
10 210) for the operational variation of the control signal
11 waveform (Us(t)), comprising:

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13 - a counter device {12; 112; 212} which can be supplied
14 with a predefined clock signal (fc) in order to
15 provide a time-dependent digital counter signal (X),

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17 - a memory unit (14; 114; 214) which can be supplied
18 with the digital counter signal (X), for storing a
19 series (Y) of digital control signal values (Y1, Y2
20 ...) and for successively issuing individual control
21 signal values (Y1, Y2 ...) from the series of control
22 signal values (Y) in accordance with the counter
23 signal (X), and

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25 - a digital-to-analog converter unit (16; 116; 216) for
26 converting the issued digital control signal values
27 (Y1, Y2 ...) into the analog control signal (Us) for
28 the engine control unit {ECU}.

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30 2. Circuit configuration (10; 110; 210) according to Claim 1,
31 whereby in order to provide the clock signal (fc) with the
32 selected frequency a voltage controlled oscillator (224)
33 to which the modification signal (S) is applied as a time

1 scaling signal is used.

2

3 3. Circuit configuration (10; 110; 210) according to Claim 1,
4 whereby in order to provide the clock signal (fc) with the
5 selected frequency an oscillator with a fixed oscillation
6 frequency and divider (18; 118) connected downstream of
7 the oscillator is used whose division ratio is determined
8 by the modification signal (S) input to the divider as a
9 time scaling signal.

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11 4. Circuit configuration (10; 110; 210) according to one of
12 the preceding claims, whereby a series of at least 30, in
13 particular at least 50 control signal values (Y₁, Y₂ ...
14 Y_N), is provided as the series of control signal values
15 (Y) stored in the memory unit (14; 114; 214).

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17 5. Circuit configuration (10; 110; 210) according to one of
18 the preceding claims, whereby the series of control signal
19 values (Y) stored in the memory unit (14; 114; 214)
20 approaches a continuous function.

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22 6. Circuit configuration (10; 110; 210) according to one of
23 the preceding claims, whereby the digital control signal
24 values (Y₁, Y₂ ...) are provided with a resolution of at
25 least 8 bits.

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27 7. Circuit configuration (10; 110; 210) according to one of
28 the preceding claims, whereby the memory unit {14; 114;
29 214} takes the form of a read-only memory.

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31 8. Method for generating a control signal (U_s) for an engine
32 control unit (ECU) designed to control at least one fuel
33 injector of an internal combustion engine, whereby

1 operating parameters of the internal combustion engine (p,
2 T, ...) and/or of the fuel injector are used for
3 generating a modification signal (S) for the operational
4 variation of the control signal shape ($U_s(t)$), comprising:

- 5
- 6 - counting a predefined clock signal (f_c) in order to
7 provide a time-dependent digital counter signal (X),
8 whereby the clock signal (f_c) is predefined with a
9 frequency which is set in accordance with the
10 modification signal (S),
 - 11
 - 12 - successive issue of individual digital control signal
13 values ($Y_1, Y_2 \dots$) in accordance with the counter
14 signal (X) from a previously stored series (Y) of
15 control signal values ($Y_1, Y_2 \dots Y_N$), and
 - 16
 - 17 - conversion of the issued digital control signal values
18 ($Y_1, Y_2 \dots$) into the analog control signal (U_s) for
19 the engine control unit (ECU), whereby the conversion
20 of the digital control signal values ($Y_1, Y_2 \dots$) into
21 the analog control signal (U_s) is implemented by
22 taking the modification signal (S) into account as an
23 amplitude scaling signal.

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